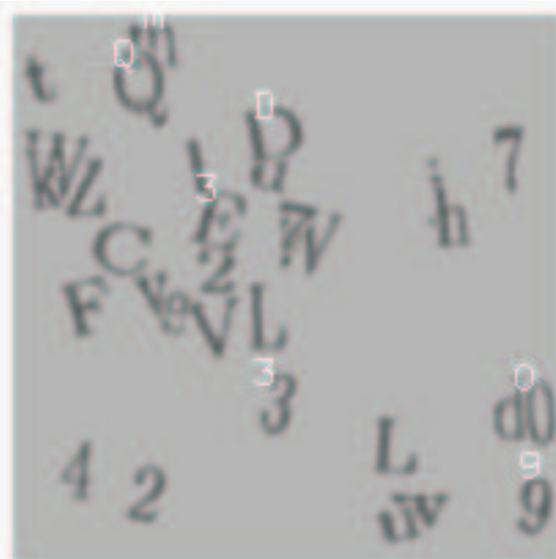


Analysis of complex visual scenes.

Where? What?



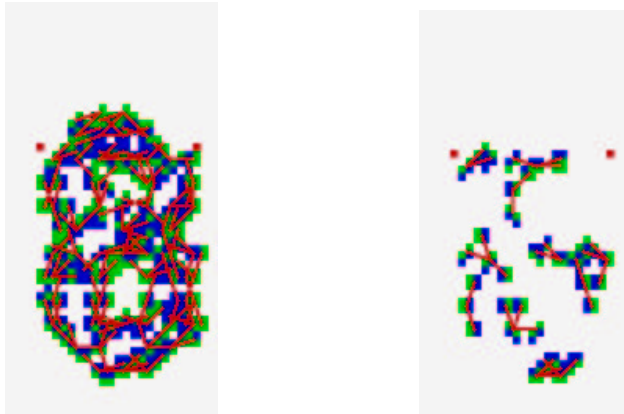




Detection and classification.

- Statistical models:

Models based on hierarchies of *binary* features. Keep it simple!



Hierarchies of features/objects:

Primitive local features



Complex local features



Generic object parts



- Invariance: Clutter.



How do we generalize to other fonts??

- Invariance: Geometric variation - linear, nonlinear.



- Architectures:

Classification trees - 99.3% classification rate on handwritten digits. But... very sensitive to clutter.

Simple neural networks - perceptrons.

- Learning/training:

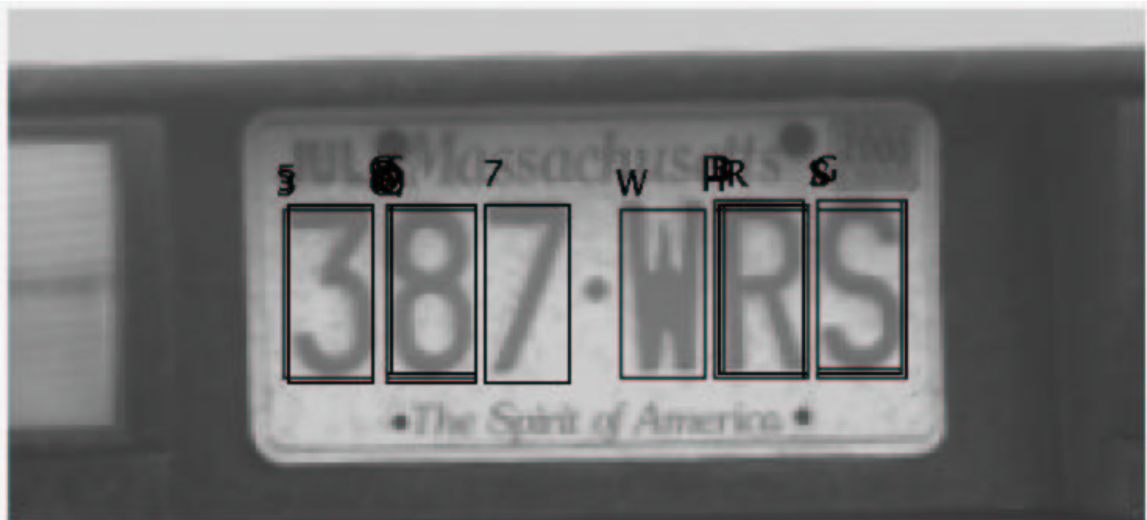
Small data sets!

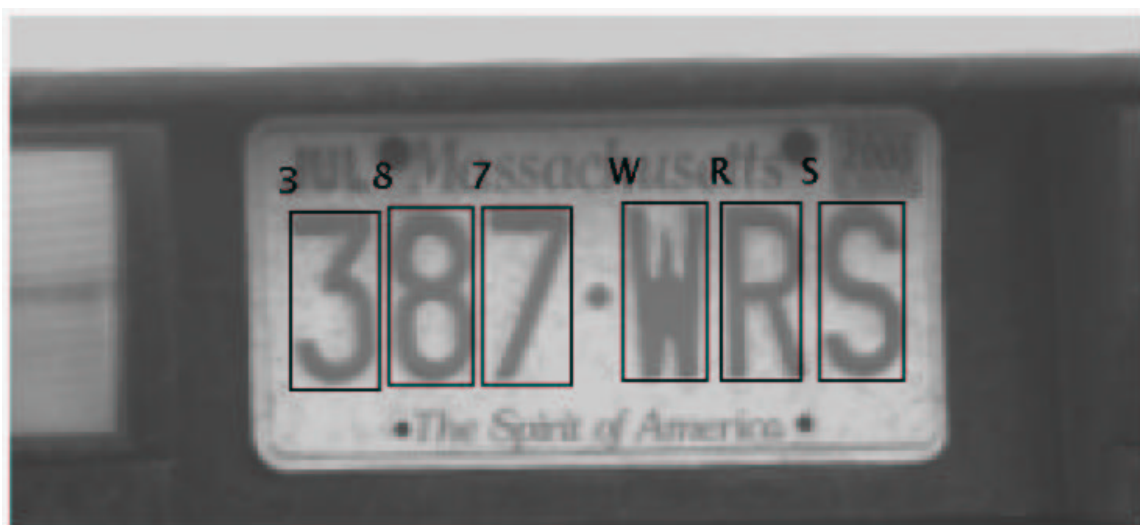
- Efficient computation:

Coarse to fine!



How do we get rid of the false positive??

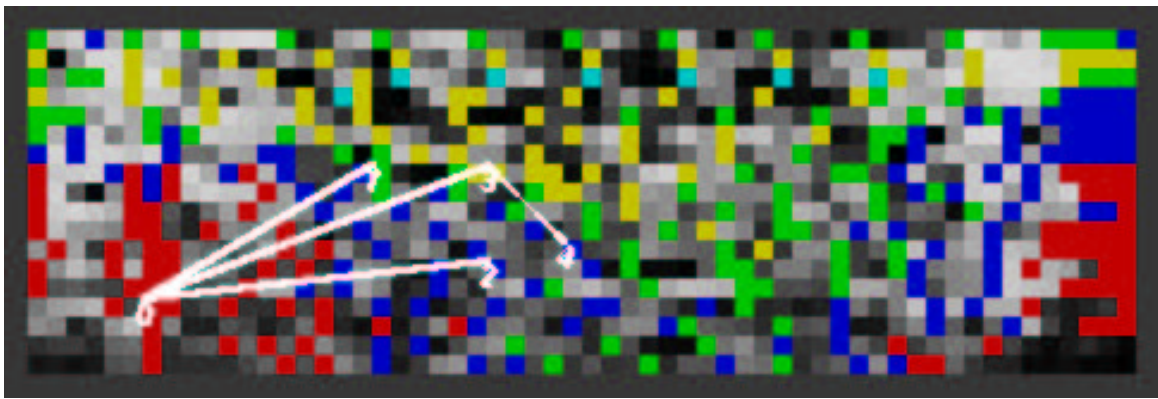




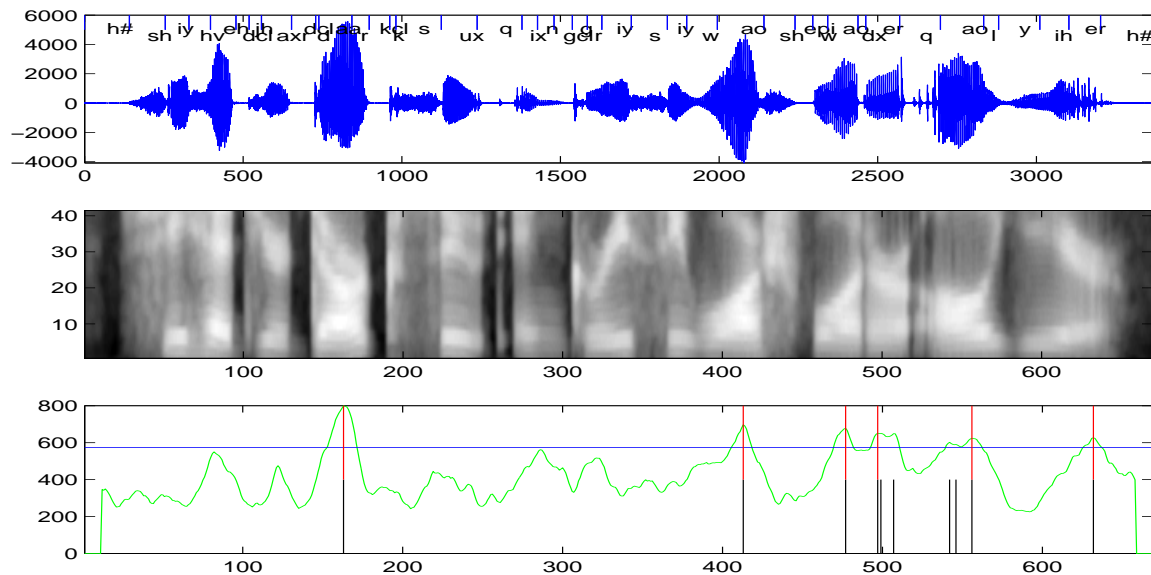
Speech Recognition: auditory scenes

The same issues, similar techniques?

Classification:



Detection:

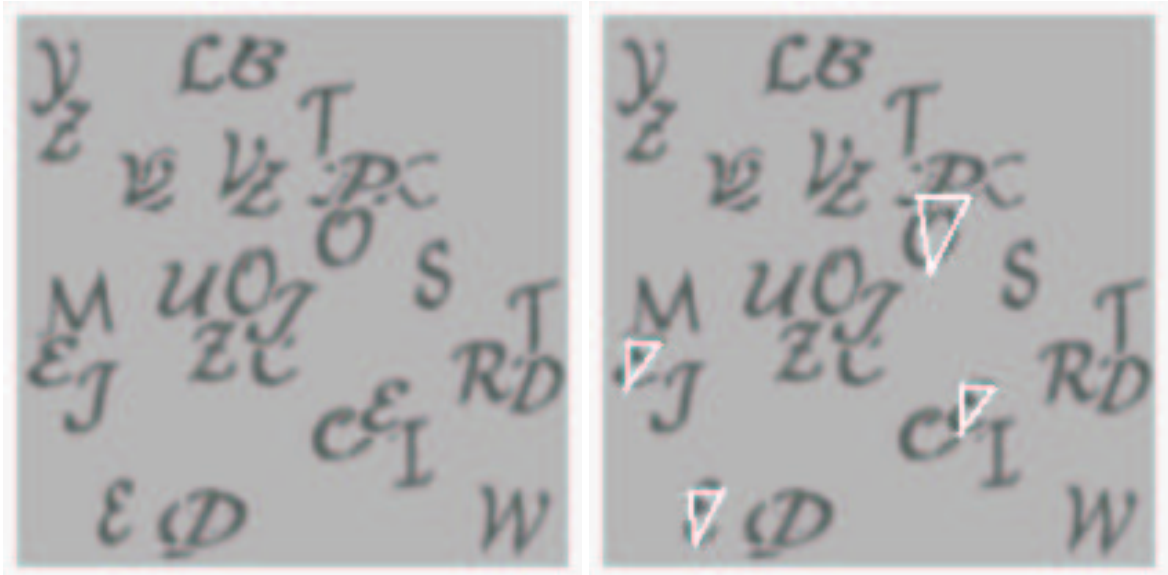


...Departure from classical Hidden Markov Models.

Biological Connections

- Modeling: Parallel architectures for learning, detecting and classifying.
- Psychophysical experimentation: test hypotheses generated by the models.

Find the \mathcal{E}



- Possibility of electro-physiological experimentation.